REMARKS/ARGUMENT

Claims 1-18 and 27-43 are pending in the present application.

Section 103 Rejection

a. Matityaho and Soltau

The Examiner has rejected all of the pending claims primarily over the Matityaho article and the Soltau article. Applicants respectfully traverse.

As mentioned in applicants' previous response—and as conceded by the Examiner—the Matityaho article does not disclose a "multi-stage classifier," as recited in all of the claims. Moreover, the Matityaho article does not disclose a multi-stage classifier with "one or more first stage classifiers" which "generat[e]" a "metalearner vector" from a "learning representation" of the audio signal.

The Soltau article does not remedy this deficiency. The Soltau article discloses yet another music genre classification system which uses a single neural network classifier. Rather than merely using a frequency representation disclosed in the Matityaho paper to generate input vectors for the neural network classifier, the Soltau article discloses the use of a more involved time modeling representation of the audio signal. An acoustic analysis is conducted on the initial feature vectors, after which a temporal structural analysis is conducted. What is called the "characteristic vector" is merely a more involved input vector with various additional features extracted through the afore-mentioned modeling.

Accordingly, the Soltau article does not disclose a "multi-stage classifier." The modeling steps referred to in the Soltau article, e.g., as set forth in Figure 1, would not be characterized by anyone of skill in the art as a "classifier." The Soltau article does not suggest or disclose a "first stage classifier." Nor does it disclose using the "first stage classifier" to generate a "metalearner vector" which is then "utilized by the final stage metalearner classifier to generate the classification".

This point is made even more evident when one considers the Examiner's purported explanation motivating the combination of Soltau and the Matityaho articles. The Examiner claims that Soltau improves the efficiency of the neural network "through vector dimension

reduction." Office Action, Page 4. The use of a multi-stage classifier in the present invention is not motivated by vector dimension reduction, and has nothing to do with that particular discussion in the Soltau article. Rather, the multi-stage classifier uses the first-stage classifiers to generate initial classifications which are then input in the form of a "metalearner vector" into the final stage classifier. The final stage classifier, in a sense, "learns" based on the classifications of the first stage classifiers. In a preferred embodiment discussed in the specification, the first stage classifiers are support vector machines, one for each music artist to be classified, while the final stage classifier is a neural network.

Again, it should be emphasized that the Matityaho and Soltau articles are directed specifically to simple genre classification, i.e., is the audio data "classical" music or is it a "pop" song? There is no suggestion in either that they are able to achieve artist classification, as achieved by the present invention.

Accordingly, the Matityaho paper, alone or in combination with the other cited references including the Soltau article, does not disclose or suggest this structure.

With specific reference to some to the Examiner's comments with respect to the dependent claims, it should be noted that the Matityaho article does not disclose "about 0.8 second" time slice. Rather, the article specifically states that the neural network "should be trained with an interval of at least 0.3 sec but no longer 0.7 sec." Accordingly, the Matityaho article does not disclose at interval of between about 0.8 to 1.2 seconds as set forth in claims 4, and 30.

b. Rossum Patent

The Rossum patent is directed to general digital audio formats and is unrelated to the issue of generating representations of audio data for machine learning. The reference within Rossum cited by the Examiner merely states that an octave is "a logarithimic measure of frequency implying doubling." This hardly discloses or is directed to how to subdivide time slices of audio data for effective machine mearning.

c. Goldin Patent

The Goldin patent is directed to a multichannel recording system for a general purpose computer. The Examiner argues that the Goldin patent discloses using a "cutoff frequency" of 11kHz. The "cutoff" referred to in the Goldin patent refers to the bandwidth of audio data which

is moving between components in the recording system, depending on how many channels and what sampling rate are utilized. The Goldin patent does not have anything to do with selecting frequency bands for use by machine learning classifier.

d. Dumais Patent

The Dumais patent is specifically directed to a text classifier. It discloses no more than the use of the support vector machine framework for textual classification. It can hardly be considered analogous art, since it is specifically directed to a classifier designed for textual classification. Moreover, it merely discloses, in general, the support vector machine framework for machine learning.

e. Yoda Patent

The Yoda patent is directed to a specific neural network structure which includes what it refers to as "intermediate nodes". The intermediate nodes encode a separate template pattern, each template having an associated class. Accordingly, when the Yoda patent refers to "classes" and inputs, it is referring to a very different structure than the present invention. Claims 12, 13 and 38, 39 refer to a "category of classification", e.g., a music artist category. Claim 12, for example, reflects the "metalearner" structure of the neural network, by pointing out that there is one input node for each classification category, as well as one output node per classification category. The cited passages of the Yoda patent do not reflect this structure.

f. Kramer Patent

The Kramer patent is merely directed to examining the reliability of a neural network in the abstract. It does not disclose or suggest the claimed invention, either alone or in combination with the above references.

Conclusion

Applicants respectfully submit that the pending claims represent patentable subject matter and that the application is in condition for allowance. If the Examiner has any questions, please feel free to contact the undersigned at 609 951-2522. Authorization is hereby given to charge any fees which may be required, except the issue fee, to Deposit Account 14-0627.

Respectfully submitted,

Benjamin S. Lee
Reg. No. 42,787
Tel. No. 609 951-2522

October 19, 2005

NEC Laboratories America, Inc.
4 Independence Way
Princeton, NJ 08540
Tel No. 609 951-2522
Fax No. 609 951-2480

Docket No. 14855 (NECI-1107)